discharging the semi-solidified slurry from a discharge port at the lower end of the chamber by moving the extrusion screw in the axial direction thereof;

turning the semi-solidified slurry in the horizontal direction; and

injecting the turned semi-solidified slurry into molding plates opening or closing in the horizontal direction.

25. (Amended) An injection molding apparatus for a light metal alloy, comprising:

a chamber;

an extrusion screw located substantially vertically and provided rotationally inside said chamber, wherein the extrusion screw is mounted for movement in the axial direction thereof, to extrude the molten metal of the semi-solidified slurry;

a cooling unit for cooling a light metal material in said chamber so as to be formed into a molten metal or semi-solidified slurry;

a connection member having a first internal channel substantially in a vertical direction and a second internal channel extending horizontally from the lower end of the first channel, said connection member being connected to a discharge port of said chamber;

a nozzle connected at the discharge end of said connection member; and

a clamping device for injection molding the molten metal or the semi-solidified slurry discharged from said nozzle, wherein said clamping device is adapted to open or close a movable plate relative to a stationary plate in a horizontal direction.--

REMARKS

Favorable reconsideration of the present application is respectfully requested.

Claim 5 has been cancelled. Claims 2-4 and 6-25 are active in the application.

Claim 24 has been amended to recite that the step of discharging the semi-solidified slurry from the discharge port at the lower end of the chamber is performed "by moving the extrusion screw in the axial direction thereof." Similarly, Claim 25 has been amended to recite that the extrusion screw "is mounted for movement in the axial direction thereof, to extrude the molten metal of the semi-solidified slurry. As is described at lines 20-27 of page 16 in the specification, the metered semi-solidified slurry 7 accumulated at the lower end of the exemplary chamber 2 is injected by the downward movement of the screw 3, by way of the injection flow channel 17 of the connection pipeline 14 into the cavity of the molding plates, and molded into a predetermined shape. Applicants respectfully submit that the cited prior art fails to teach or suggest an injection molding apparatus or method having such an extrusion screw movement feature.

Claim 3, which recites an extruder having axial movement as is now recited in Claims 24 and 25, had been rejected under 35 U.S.C. § 102 as being anticipated by the newly-cited JP '874. Similarly, Claims 8 and 9 were rejected under 35 U.S.C. § 103 as being obvious over JP '874. JP '874 discloses a casting device for a composite metal product in which a screw extruder having a screw 7 injects a semisolid material into a horizontal chamber for delivery to a die A. However, there is no description in JP '874 that the extrusion screw is mounted for movement in the axial direction thereof, nor is any structure disclosed in this reference for providing such axial movement. Indeed, there is no teaching or suggestion, either explicit or inherent, for such a feature. Nor has the Examiner alleged that this feature is present in JP '874, despite the rejection of Claim 3 as being anticipated by this reference. Applicants therefore respectfully submit that the amended claims clearly define over JP '874.

Claims 4, 6 and 16 stand rejected under 35 U.S.C. § 103 as being obvious over JP '874 in view of Kono, which was cited to teach a rounded joint between the first and second

channels. However, Kono provides no suggestion for the claimed moveable mounting feature for the extrusion screw of JP '874, and so the claims are believed to clearly define over any combination of these references.

Claims 10-15 were rejected under 35 U.S.C. § 103 as being obvious over JP '874 in view of Kono and Rock, while Claims 18-20 were rejected under 35 U.S.C. § 103 as being obvious over JP '874 in view of Mercer. However, neither of the secondary references teaches or suggests the moveably mounted extrusion screw feature now recited in the independent claims, and so all of the claims are believed to define over any combination of these references.

Applicants therefore believe that the present application is in a condition for allowance and respectfully solicit an early Notice of Allowability.

Respectfully submitted,

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IN THE CLAIMS

Please cancel Claim 5.

6. (Amended) An injection molding apparatus as defined in claim [5] 25, wherein a check valve is disposed in the first channel for preventing the semi-solidified slurry in the second channel from flowing backward to the screw extruder.

24. (Twice Amended) A method of injection molding a light metal alloy comprising the steps of:

cooling a molten metal under shearing by an extrusion screw into a semi-solidified slurry in a substantially vertical chamber;

discharging the semi-solidified slurry from a discharge port at the lower end of the chamber by moving the extrusion screw in the axial direction thereof;

turning the semi-solidified slurry in the horizontal direction; and

injecting the turned semi-solidified slurry into molding plates opening or closing in the horizontal direction.

25. (Amended) An injection molding apparatus for a light metal alloy, comprising:

a chamber;

an extrusion screw located substantially vertically and provided rotationally inside said chamber, wherein the extrusion screw is mounted for movement in the axial direction thereof, to extrude the molten metal of the semi-solidified slurry;

a cooling unit for cooling a light metal material in said chamber so as to be formed into a molten metal or semi-solidified slurry;

a connection member having a first internal channel substantially in a vertical direction and a second internal channel extending horizontally from the lower end of the first channel, said connection member being connected to a discharge port of said chamber;

a nozzle connected at the discharge end of said connection member; and

a clamping device for injection molding the molten metal or the semi-solidified slurry discharged from said nozzle, wherein said clamping device is adapted to open or close a movable plate relative to a stationary plate in a horizontal direction.--